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H.R. 3060, THE ANTARCTIC ENVIRONMENTAL  
PROTECTION ACT OF 1996

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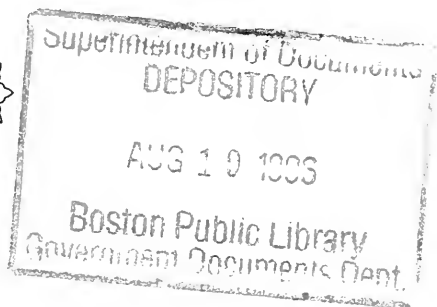
HEARING  
BEFORE THE  
COMMITTEE ON SCIENCE  
U.S. HOUSE OF REPRESENTATIVES  
ONE HUNDRED FOURTH CONGRESS

SECOND SESSION

APRIL 18, 1996

[No. 42]

Printed for the use of the Committee on Science



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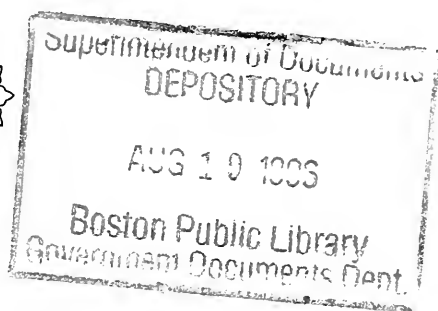
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# CONTENTS

## WITNESSES

	Page
April 18, 1996:	
Eileen Claussen, Assistant Secretary of State, Oceans and International Environmental and Scientific Affairs, U.S. Department of State, Wash- ington, DC .....	3
Dr. Neal F. Lane, Director, National Science Foundation, Washington, DC .....	7
Kathryn S. Fuller, President, World Wildlife Fund, Washington, DC .....	21
Robert H. Rutford, Excellence in Education Foundation Chair, Professor of Geosciences, University of Texas at Dallas .....	26



# H.R. 3060, THE ANTARCTIC ENVIRONMENTAL PROTECTION ACT OF 1996

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THURSDAY, APRIL 18, 1996

U.S. HOUSE OF REPRESENTATIVES,  
COMMITTEE ON SCIENCE,  
*Washington, DC.*

The committee met at 9:55 a.m. in Room 2318 of the Rayburn House Office Building, the Honorable Robert S. Walker, chairman of the committee, presiding.

The CHAIRMAN. The Committee will come to order. I want to welcome everyone to our hearing on H.R. 3060, the Antarctic Environmental Protection Act of 1996, legislation I introduced on March 12, 1996 to enable the United States to implement the 1991 Protocol on environmental protection to the Antarctic Treaty.

While the subject of protocols and treaties is often complex, the goal of H.R. 3060 is quite simple. Once signed into law, H.R. 3060 will help protect an environmental and scientific treasure, Antarctica.

It is important to remember that the scientific value of this great continent is tied directly to the pristine nature of its environment. Conversely, much of the research done in the Antarctic is vital to the understanding of our global environment.

If we impose too onerous restrictions on American researchers, our ability to understand the world's environment will suffer.

H.R. 3060 charts a middle course, one that I hope will preserve Antarctica as the earth's best environmental laboratory.

H.R. 3060 now has over 20 cosponsors. I want to thank in particular Mr. Brown, the Ranking Member of the Full Committee and my subcommittee chairs, Connie Morella, Steve Schiff and Dana Rohrabacher for their support of this bill.

Just as the research is a joint effort on the ice, this legislation has been a joint and bipartisan effort in this Committee.

Today we'll be taking testimony from the State Department, the National Science Foundation, and the scientific research and environmental communities.

All four have played an important and supporting role in crafting H.R. 3060.

The hearing is particularly timely since the representatives of the United States will be attending the 20th Annual Antarctic Treaty Consultative Meeting later this month in the Netherlands.

Our representatives will be able to report that we are making legislative progress toward implementing the treaty that reflects America's continued commitment to the protection of the Antarctic environment.

Briefly, H.R. 3060 provides the legislative authority necessary for the United States to implement the 1991 Protocol on environmental protection to the Antarctic Treaty. The Protocol which resulted from the United States' initiative represents an important addition to the uniquely successful system of peaceful cooperation and scientific research that has evolved under the Antarctic Treaty.

The U.S. Senate gave its advice and consent to ratification of the Protocol in 1992. All that remains for the United States to become a party to the Protocol is to enact the necessary implementing legislation. The Protocol will activate when all 26 of the Antarctic Treaty consultative parties implement it.

So far 20 of the consultative parties have done so. The United States ratification will provide impetus for the remaining five to join as well.

Implementation of the Protocol has been a priority of both Republicans and Democrats since the Protocol was negotiated in 1991.

The Protocol builds upon the Antarctic Treaty to improve the treaty's effectiveness for ensuring the protection of the Antarctic environment.

The Protocol reaffirms the treaty's use of Antarctica exclusively for peaceful purposes and accords priority to scientific research among the permitted activities.

The Protocol prohibits mineral resource activities other than scientific research in Antarctica. Its annexes, which form an integral part of the Protocol, set out specific rules on environmental impact assessment, conservation of Antarctic fauna and flora, waste disposal and management, the prevention of marine pollution and the area protection and management.

H.R. 3060 is a good bill. I hope to bring this bill before the Committee very soon, and I look forward to its passage.

Before recognizing our first panel, I would like to turn to the Ranking Minority Member, Mr. Brown, for any opening remarks that he might have.

Mr. BROWN. Thank you very much, Mr. Chairman. I will compliment you on bringing it to this point, and I am very pleased that we're moving in a cooperative and felicitous way toward passage.

I ask unanimous consent to insert the rest of my remarks in the record.

The CHAIRMAN. Without objection.

[The prepared statement of Mr. Brown follows:]



## OPENING STATEMENT

## HEARING ON

## H.R. 3060, THE ANTARCTIC ENVIRONMENTAL PROTECTION ACT

BY

THE HONORABLE GEORGE E. BROWN, JR. (D-CA)

RANKING DEMOCRATIC MEMBER

COMMITTEE ON SCIENCE

APRIL 18, 1996

I congratulate the Chairman for convening this hearing to consider H.R. 3060, which will allow the United States to implement the Protocol on Environmental Protection to the Antarctic Treaty.

The Antarctic Treaty has been a noteworthy success for more than 35 years in providing a framework for international collaboration in scientific research. The Protocol builds on the Antarctic Treaty to extend and improve the Treaty's effectiveness for ensuring the protection of the Antarctic environment. It designates Antarctica as a natural reserve, devoted to peace and science, and sets forth environmental protection principles and specific rules applicable to all human activities on the continent.

Protection of the Antarctic environment is important both because of Antarctica's intrinsic value as one of the last pristine regions of the globe and because it has enormous value as a scientific laboratory. Scientists from many nations conduct research there in a broad range of areas in the physical and biological sciences. Antarctica is especially important as a research platform for studies of world climate and global environmental change. Environmental degradation could impair much of this research.

The Antarctic Treaty Parties have devised the Environmental Protocol to provide a set of principles and procedures that will ensure that all nations institute effective environmental safeguards. The Protocol has received broad support because it was developed through consultation with the research community and with the non-governmental organizations, which are advocates for the environment.

The Protocol was signed in 1991 and was approved by the Senate well over three years ago. It is time—it is past time for the United States to move forward to final ratification.

The remaining hurdle to ratification is to provide new legislative authority to enable enforcement by federal agencies of all provisions of the Protocol. There has been disagreement in the past about how best to ensure that the provisions of the Environmental Protocol are enforced, while avoiding excessive disruption to the Antarctic research program. I am pleased that the bill under review today, H.R. 3060, appears to be an acceptable compromise for balancing environmental protection concerns against the value of the scientific research program.

I invite our witnesses to provide their views on the bill and on the need to move forward on ratification of the Environmental Protocol.

Again, I congratulate the Chairman in moving forward with the Committee's consideration of the legislation, and I look forward to the testimony this morning.

The CHAIRMAN. I would also at this point indicate that we will grant, by unanimous consent, any further opening statements by the members that might wish to participate, since the Chairman was guilty of getting us off to a very late start here.

I apologize to the witnesses for that and I will recognize first, Ms. Claussen.

**STATEMENT OF MS. EILEEN CLAUSSEN, ASSISTANT SECRETARY OF STATE, OCEANS AND INTERNATIONAL ENVIRONMENTAL AND SCIENTIFIC AFFAIRS, U.S. DEPARTMENT OF STATE, WASHINGTON, DC**

Ms. CLAUSSEN. Thank you very much, Mr. Chairman.

I am Eileen Claussen, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs.

I have some brief opening remarks and, with your permission, will submit my entire official statement for the record.

The CHAIRMAN. Without objection.

Ms. CLAUSSEN. Thank you for the opportunity to testify on H.R. 3060, the Antarctic Environmental Protection Act of 1996.

This legislation implements the Protocol on Environmental Protection to the Antarctic Treaty, a central objective of U.S. and Antarctic policy since ratification of the Protocol by the Senate in 1992.

The Protocol achieves two important goals. First, it extends standards for environmental protection to all Antarctic activities, both governmental and non-governmental, including tourism.

Second, it raises these standards for all nations active in Antarctica to levels that we are already implementing within our own Antarctic program.

We very much appreciate the initiative that you and members of the Committee have taken in introducing H.R. 3060 and moving expeditiously to schedule this hearing.

As you know, the United States is only one of six countries yet to become a party to the Protocol.

Let me talk for a moment about the importance of the Antarctic as an international resource.

Comparatively free from pollution or other human disturbance, Antarctica is an unparalleled natural laboratory for scientific research.

As an example, its icepack contains a record of the earth's climate dating back more than 160,000 years and providing us an invaluable source of knowledge about past and present global atmospheric trends.

The southern ocean which encircles Antarctica supports the world's largest coherent ecosystem including a new 12 million square mile whale sanctuary which, combined with an adjacent Indian Ocean sanctuary, is home to three-quarters of the world's whales.

The animal species that inhabit Antarctica are superbly adapted to live in frigid climates. Many of those adaptations could have practical application for modern science, technology and health, developing non-toxic alternatives for antifreeze and deicing solutions.

Antarctica also represents a model for international cooperation as it has never been fought over despite the competing claims of several nations.

The Protocol on Environmental Protection to the Antarctic Treaty safeguards these and other benefits derived from promoting peace and science in Antarctica.

H.R. 3060 represents a clear and concise approach to implementing the Protocol. It builds up existing legislation to provide the authority necessary to give full effect to all of the Protocol's provisions.

Mr. Chairman, I would like to convey the Administration's strong support for enactment of H.R. 3060. For the past four decades, the United States has led the conduct of cutting edge research in Antarctica and in the effective and peaceful governance of the continent through the Antarctic Treaty.

Passage of H.R. 3060 will reaffirm the U.S. commitment to continue to be active in Antarctic affairs.

We are encouraged by the consensus that exists on its early passage and pay tribute to the Science Committee for bringing our shared objectives within reach.

Thank you.

[The prepared statement of Assistant Secretary Claussen follows:]

# TESTIMONY OF

EILEEN CLAUSSEN

ASSISTANT SECRETARY OF STATE FOR OCEANS AND INTERNATIONAL  
ENVIRONMENTAL AND SCIENTIFIC AFFAIRS

DEPARTMENT OF STATE

BEFORE THE COMMITTEE ON SCIENCE

UNITED STATES HOUSE OF REPRESENTATIVES

APRIL 18, 1996

Mr. Chairman:

I am Eileen Claussen, Assistant Secretary of State for Oceans and International Environmental and Scientific Affairs. With me is R. Tucker Scully, Director of our Office of Oceans Affairs.

I am pleased to appear at this hearing of the Committee on Science to discuss H.R. 3060, the Antarctic Environmental Protection Act of 1996, legislation to implement the Protocol on Environmental Protection to the Antarctic Treaty. We very much appreciate that you, Congressman Brown, and members of the committee have taken the initiative in introducing H.R. 3060 and moving expeditiously to schedule this hearing.

Early entry into force and implementation of the Protocol on Environmental Protection to the Antarctic Treaty is a priority objective of United States Antarctic policy. The Senate has given its advice and consent to ratification of the Protocol. Enactment of implementing legislation to provide full legislative authority to implement its provisions is the remaining step required for the United States to deposit its instrument of ratification. H.R. 3060 amends existing laws on Antarctica to provide such authority. It does so in a manner fully consistent with United States Antarctic policy and we are particularly pleased at the bipartisan support reflected in the co-sponsorship of H.R. 3060.

Let me begin with a few words about United States Antarctic policy and the significance of the Protocol in the broad policy context.

The United States plays a key leadership role in Antarctic affairs. Our Antarctic policy over the past four decades has reflected commitment to a consistent set of objectives:

- pursuit of the unique opportunities Antarctica offers as a laboratory for basic scientific research—research which provides insights essential to the understanding of our planet;
- ensuring the protection of the Antarctic environment and conservation of its resources; and
- maintenance of Antarctica as an area of peaceful international cooperation, to which U.S. nationals have access for peaceful purposes.

The achievement of these objectives, particularly in light of differences among nations active in Antarctica over the assertion of territorial sovereignty there, depends on the dynamic international legal framework provided by the Antarctic Treaty of 1959. The Treaty provides the indispensable mechanism through which we have and continue to successfully pursue our Antarctic interests. The Protocol on Environmental Protection to the Antarctic Treaty represents further enrichment of this important mechanism.

The Antarctic Treaty Consultative Parties adopted the Protocol, including four annexes, and opened it for signature on October 4, 1991, in Madrid. (The Antarctic Treaty Consultative Parties are those Parties to the Antarctic Treaty carrying out

activities in Antarctica and that, as a result, have full decision-making rights under the Treaty.) The United States signed the Protocol at Madrid on that date.

All 26 Consultative Parties have signed the Protocol. The Consultative Parties adopted an additional annex, on area protection and management, to the Protocol at Bonn on October 17, 1991.

Turning to a description of its provisions, the Protocol on Environmental Protection to the Antarctic Treaty builds upon the Antarctic Treaty to extend and improve the Treaty's effectiveness as a means for protecting the Antarctic environment. It reaffirms the status of Antarctica as an area reserved exclusively for peaceful purposes, including in particular scientific research, and sets forth a comprehensive, legally binding system of environmental protection applicable to all human activities in Antarctica.

The Protocol is intended to replace existing recommendations under the Treaty addressing the protection of the Antarctic environment, including the Agreed Measures for the Conservation of Antarctic Fauna and Flora. It does not affect other agreements on the Antarctic to which the United States is a party, such as the Convention on the Conservation of Antarctic Marine Living Resources and the Convention on the Conservation of Antarctic Seals.

The Protocol prohibits all activities relating to mineral resources in Antarctica, except for scientific research, and provides that this ban may not be reviewed until at least 50 years following entry into force of the Protocol.

General provisions in the Protocol obligate Parties to follow environmental impact assessment procedures for proposed activities, both governmental and private, in Antarctica. In addition, Parties must provide for prompt and effective response to environmental emergencies, including development of joint contingency plans.

Detailed mandatory rules for environmental protection are incorporated in a system of annexes, which form an integral part of the Protocol. Four specific annexes were adopted for ratification with the Protocol itself:

- Annex I on environmental impact assessment sets forth a scheme for prior assessment of the environmental impact of proposed governmental and private activities in Antarctica.
- Annex II on conservation of Antarctic fauna and flora strengthens and updates the native fauna and flora protection system developed under the Agreed Measures for the Conservation of Antarctic Fauna and Flora adopted under the Antarctic Treaty in 1964.
- Annex III on waste disposal and waste management sets forth detailed requirements governing the generation, management and disposal of wastes in the Antarctic Treaty area.
- Annex IV on the prevention of marine pollution sets forth strict controls on the discharge of pollution from ships in Antarctica.

As I mentioned earlier, an annex on area protection and management, designed as a fifth annex to the Protocol, was adopted on October 17, 1991 at the Sixteenth Antarctic Treaty Consultative Meeting in Bonn. Annex V is designed to simplify, improve and extend the system of protected areas that has evolved within the Antarctic Treaty system. This annex also received Senate advice and consent to ratification along with the Protocol and the other four annexes.

The Protocol incorporates provisions to ensure effective compliance with its requirements, including compulsory and binding procedures for settlement of disputes. It also establishes a Committee for Environmental Protection to provide advice and recommendations to the Antarctic Treaty Consultative Meetings on the implementation of the Protocol.

The Protocol will enter into force 30 days following the date on which all 26 Antarctic Treaty Consultative Parties have deposited their instruments of ratification, acceptance, approval or accession. To date, 20 Consultative Parties have deposited such instruments.

As noted earlier, the United States signed the Protocol upon its adoption, in October, 1991. The Senate gave its advice and consent to ratification of the Protocol in October, 1992. Enactment of implementing legislation to provide full legislative authority to implement its provisions is all that remains for the United States to deposit its instrument of ratification.

Enactment of H.R. 3060 would not only permit the United States to become a Party to the Protocol. In our view, it would also provide impetus for the remaining ratifications necessary to bring the Protocol into force.

H.R. 3060 represents a concise and clear approach to implementing the Protocol. It builds upon existing laws to provide the authority necessary to give full effect to all of the Protocol's Provisions.

Title I amends the Antarctic Conservation Act of 1978 (16 U.S.C. 2401 *et seq.*) to provide clear authority to implement the Protocol's provisions on environmental impact assessment (Article 8 and Annex I), conservation of fauna and flora (Annex II), waste disposal and waste management (Annex III) and area protection and management (Annex V).

Specifically, it amends the definitions contained in the Antarctic Conservation Act of 1978 (16 U.S.C. 2402) (ACA) to conform with those in the Protocol. Further, it incorporates the specific obligations of the Protocol by revising and extending the ACA's definitions of prohibited acts, as well as its system of permits. With respect to the Protocol's provisions on environmental impact assessment, it implements them through application of the National Environmental Policy Act (NEPA). Finally, it sets forth the Federal agency responsibilities with respect to the Protocol's obligations, reaffirming the lead role of the National Science Foundation as the manager of our important research program in Antarctica.

Title II of H.R. 3060 addresses the Protocol's prohibition on mineral resource activities in Antarctica. It amends the Antarctic Protection Act of 1990 (16 U.S.C. 2461 *et seq.*) to make permanent the interim prohibition on such activities contained in that act.

Title III of H.R. 3060 addresses Annex IV of the Protocol on Marine Pollution. It recognizes that the primary substantive provisions of Annex IV have already been implemented through the Act to Prevent Pollution from Ships (33 U.S.C. 1901 *et seq.*) and includes technical amendments to conform its references to the Protocol.

In conclusion, Mr. Chairman, I would like to convey the Administration's strong support for enactment of H.R. 3060. I believe that we can all take pride in the United States achievements in Antarctica over the past four decades. We have set the standard in the conduct of cutting-edge research there; we have taken the lead in innovative arrangements to conserve its resources; and we have guaranteed the effective and peaceful governance of the continent through the Antarctic Treaty. And, as with the Antarctic Treaty itself, United States leadership was crucial to the conclusion of this Protocol to the Antarctic Treaty. Passage of H.R. 3060 will reaffirm the United States commitment to continue to play this role. We are encouraged by the consensus that exists on its early passage and pay tribute to your leadership and that of Representative Brown and the members of the Science Committee in bringing our shared objective within reach.

The CHAIRMAN. Thank you for your statement.

Dr. Lane, welcome. We appreciate your being with us, and we'd be happy to have your testimony.

#### **STATEMENT OF DR. NEAL F. LANE, DIRECTOR, NATIONAL SCIENCE FOUNDATION, WASHINGTON, DC**

Dr. LANE. Thank you, Mr. Chairman.

I very much appreciate this opportunity to discuss the legislation that you have introduced to implement the Protocol on environmental protection to the Antarctic Treaty.

It was almost 40 years ago that the International Geophysical Year was organized to bring scientists from around the world to conduct research in Antarctica. This event is generally considered as the starting point of an era of outstanding science at one of the last frontiers on earth.

A growing appreciation of the Antarctic environment and the knowledge that we've gained and can gain from research in the Antarctic was an impetus in our active role in negotiating the Protocol.

In designating Antarctica as a natural reserve devoted to peace and science, the Protocol establishes a comprehensive environmental protection regime governing activities undertaken there.

The National Science Foundation wholeheartedly supports the Protocol's basic goal of according priority for research while requiring that all activities, including scientific research, be undertaken in a manner that preserves the Antarctic environment.

Antarctic scientific research has made and continues to make invaluable contributions to our understanding of the history of the earth, the evolution of the universe, and global processes. Especially now, in times of heightened environmental awareness, Antarctic research provides crucial understanding and insight into global climate change, ozone depletion, long-range weather forecasting and other global issues.

I would like to very briefly describe a couple of examples of exciting research currently underway.

The annual expansion and contraction of the sea ice doubles the area of the sea ice in the southern hemisphere. The sea ice is a habitat for organisms from bacteria to marine mammals. And studies of the dynamics and the thermodynamics of this entire system are critical for understanding the role of the Antarctic in the climate change and world ocean circulation.

Marine biologists have discovered that Antarctic fish have adapted to their icy habitats by developing an antifreeze protein, in fact, a number of antifreeze proteins. There may be several commercial applications for these proteins since they are 300 times more effective in preventing freezing than conventional chemical antifreezes, and they have other advantages as well.

For example, they may be useful to prevent food from freezing or to engineer cold resistance in living plants. They may also be used as non-polluting de-icing agents.

The remarkably transparent ice sheet at the South Pole makes it an ideal location for installing an instrument called the Antarctic Muon and Neutrino Detector Array, AMANDA, we call it. It is an instrument to map the extragalactic neutrinos coming from all around the universe from very high energy events that we have yet to fully understand.

This recently recognized feature of the ice sheet will open new opportunities for neutrino astrophysics, allowing astronomers to see inside celestial objects such as the cores of galaxies.

The United States, Russia, and French Antarctic Programs have worked together to obtain the world's deepest ice cores. These ice cores are providing an invaluable record of past climatic and environmental conditions as far back now as 300,000 years ago, and are providing insights into how the global climate may change in the future.

Finally, paleontologists have discovered the first dinosaur bones ever found in the Antarctic. They are actually found up here at the tip of the peninsula. Right up in here in this zone we find dinosaur bones. Fossil records that help us understand the Antarctic climate and the evolution of life at a time when the Antarctic was itself part of a super continent, Gondwanaland a very long time ago.

Antarctic fossil discoveries have also helped clarify the record of destruction of many of the planet's species some 65 million years ago.

The Antarctic continent and the surrounding seas provide an unmatched natural laboratory for scientific research. The National Science Foundation, as the lead agency and manager of the U.S. Antarctic Program, is committed to protecting that natural laboratory, and to that end has strengthened its environmental management over the past several years.

Although the Protocol is not yet in force, NSF already conducts Antarctic activities in a manner consistent with the Protocol's requirements. For example, we issued Antarctic waste management regulations in 1993 which implemented the Protocol's comprehensive waste management requirements.

NSF also removes virtually all of its waste from Antarctica. This aggressive level of waste minimization, segregation, and recycling is without precedent. Nearly 70 percent of the waste removed for disposal is reused or recycled. That is twice the rate of any U.S. city.

NSF has also issued environmental assessment research in compliance with the Protocol. An environmental review is conducted for all planned activities and appropriate documentation is prepared consistent with both the Protocol and in the National Environmental Policy Act.

To enforce its management and stewardship responsibilities, the NSF has appointed and trained Antarctic Conservation Act Enforcement Officers to ensure compliance and to educate citizens working in or visiting the Antarctic.

A U.S. Antarctic Treaty inspection team recently visited eight nations at their research stations across the Antarctic continent and in their report, the inspection team concluded that McMurdo Station, the U.S. Antarctic Program's largest research station, meets the highest standards in both the science it supports and in the environmental practice that it observes.

I might add as a sidelight that the US Antarctic Program received a Gold Medal Clean Seas International Award in recognition of its role in organizing an emergency spill response team comprised of experts from the Navy, NOAA, Coast Guard and private contractors to clean up the Bahia Paraiso oil spill.

Mr. Chairman, NSF believes that H.R. 3060 fully and effectively implements the Protocol. We strongly support passage of the bill because it achieves an appropriate balance between sound environmental practices and unique scientific research in the Antarctic. It builds upon NSF's many years of experience in managing the Antarctic Program and in administering the Antarctic Conservation Act.

And it authorizes NSF to put in place regulations necessary and appropriate to implement the provisions of the Protocol generally, thereby allowing NSF to address new environmental issues as they arise.

And it relies upon the expertise of other agencies, such as the State Department, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Coast Guard.

NSF anticipates a productive and a cooperative working relationship with these agencies as together we fully implement the requirements of the Protocol.

I wish to thank the Committee for its hard work in developing this bill, the strong bipartisan support and helping to obtain the unanimous support of the legislation, the environmental community, the scientific community, and the relevant federal agencies.

Thank you, Mr. Chairman.

[The prepared statement of Dr. Lane follows:]

STATEMENT OF  
DR. NEAL F. LANE  
DIRECTOR, NATIONAL SCIENCE FOUNDATION  
BEFORE THE  
COMMITTEE ON SCIENCE  
U.S. HOUSE OF REPRESENTATIVES

APRIL 18, 1996

Thank you, Mr. Chairman, for this opportunity to discuss the legislation that you have introduced to implement the Protocol on Environmental Protection to the Antarctic Treaty.

The Protocol, signed by the United States at Madrid on October 4, 1991, and given the advice and consent of the Senate on October 7, 1992, designates Antarctica as a natural reserve, devoted to peace and science, and establishes a comprehensive environmental protection regime governing activities undertaken there. The National Science Foundation whole-heartedly supports its basic goal of according priority to research, while requiring that all activities, including scientific research, be undertaken in a manner that preserves the Antarctic environment.

Antarctic scientific research has made and continues to make invaluable contributions to our understanding of the history of the earth, the evolution of the universe, and global processes. Especially now, in times of heightened environmental awareness, Antarctic research provides crucial understanding and insight into global climate change, ozone depletion and other global issues. I would like to briefly describe some of the exciting research underway:

- The annual expansion and contraction of sea ice doubles the area of sea ice in the southern hemisphere. The sea ice is a habitat for organisms from bacteria to marine mammals. Studies to improve our understanding of the dynamics and thermodynamics of this system are critical for understanding the role of the Antarctic region in climate change and world ocean circulation. Understanding Antarctica's important role in global ocean circulation will better our understanding of the effect of greenhouse gases on global climate change and the earth's heat budget.
- Marine biologists have discovered that Antarctic fish have adapted to their icy habitats by developing antifreeze proteins. There may be several commercial applications for these proteins since they are 300 times more effective in preventing freezing than conventional chemical antifreezes. For example, they may be useful to prevent food from freezing or to engineer cold resistance in living plants. They may also be used as non-polluting de-icing agents.
- The remarkably transparent ice sheet at the South Pole makes it the ideal location for installing an Antarctic Muon and Neutrino Detector Array (AMANDA) to map extraterrestrial neutrino sources. This recently recognized feature of the ice sheet will open new opportunities in neutrino astrophysics, allowing astronomers to see inside such celestial objects as the cores of galaxies.
- The United States, Russian and French Antarctic Programs have worked together to obtain the world's deepest ice cores. These ice cores are providing an invaluable record of past climatic and environmental conditions as far back as 300,000 years ago and are providing insights into how the global climate may change in the future.
- Paleontologists have discovered the first dinosaur bones ever found in Antarctica. These and other fossil records are providing new insights into the Antarctic climate and the evolution of life at a time when Antarctica was part of the supercontinent Gondwanaland. Antarctic fossil discoveries have also helped clarify the record of destruction of many of the planet's species some 65 million years ago.

The Antarctic continent and surrounding seas provide an unmatched natural laboratory for scientific research. The National Science Foundation, as lead agency and manager of the United States Antarctic Program (USAP), is committed to protecting that natural laboratory, and to that end, has strengthened its environmental management over the past several years. Although the Protocol is not yet in force, NSF already conducts its Antarctic activities in a manner consistent with the Protocol's requirements. For example, we issued Antarctic waste management regulations in



1993 which implemented the Protocol's comprehensive waste management requirements. NSF also removes virtually all of its waste from Antarctica. This aggressive waste minimization, segregation, and recycling effort of the USAP is without precedent. Nearly 70% of the waste removed for disposal is reused or recycled—more than twice the average rate of U.S. cities.

NSF has also issued environmental assessment regulations in compliance with the Protocol. An environmental review is conducted for all planned activities and appropriate documentation is prepared consistent with both the Protocol and the National Environmental Policy Act.

To implement its management and stewardship responsibilities, the NSF has appointed and trained Antarctic Conservation Act Enforcement Officers to ensure compliance and to educate citizens working in or visiting the Antarctic.

Last year a U.S. Antarctic Treaty inspection team visited eight nations' research stations across the Antarctic continent. In their report, the inspection team concluded that McMurdo Station, the USAP's largest research station, "meets the highest standards in both the science it supports and in the environmental practices it observes." I might add as a sidelight that USAP received a Gold Medal Clean Seas International Award in recognition of its role in organizing an emergency spill-response team comprised of experts from the Navy, NOAA, Coast Guard and private contractors to clean-up the Bahia Paraiso oil spill.

Mr. Chairman, NSF believes that H.R. 3060 comprehensively and effectively implements the Protocol. We strongly support passage of this bill, because it achieves the appropriate balance between sound environmental practices and unique scientific research in the Antarctic; it builds upon NSF's many years of experience in managing the Antarctic Program and in administering the Antarctic Conservation Act; it authorizes NSF to promulgate regulations necessary or appropriate to implement the provisions of the Protocol generally, thereby allowing NSF to address new environmental issues as they arise; and it takes advantage of the expertise of other agencies such as the State Department, the Environmental Protection Agency, the National Oceanic and Atmospheric Administration, and the Coast Guard. NSF anticipates a productive and cooperative working relationship with these agencies as together we fully implement the requirements of the Protocol.

I wish to thank the Committee for its hard work in developing this bill and helping to obtain broad support for this legislation from the environmental community, the scientific community and relevant Federal agencies.

The CHAIRMAN. Thank you very much, Dr. Lane.

First of all, I remember when I was in Antarctica about 15 years ago, they were doing some of the first findings of those antifreeze proteins that you referred to in your testimony, and that is an exciting bit of research that has come out of Antarctica.

Ms. Claussen, in your testimony, you indicate that the passage of this legislation would not only enable the United States to become a party to the Protocol, but also help in pressuring the remaining five consultative partners to ratify the Protocol.

Can you give us any kind of an assessment as to how long it might take the other five to come on board, once the U.S. has acted?

Ms. CLAUSSEN. Well four of them are already involved in their own parliamentary processes. And I believe a little push from us will probably put them over the edge and get them into this very, very soon.

The one that we are less sure about is Russia, but I think if we were to move ahead, we are in the best position to pressure them, which we would do. And I believe that maybe within a year or something after we move forward, we could probably get them on board, and at the same time we think everyone else will be moving ahead as well.

The CHAIRMAN. What happens if any of them would fail to act?

Ms. CLAUSSEN. Well, I mean, we have a problem because it's a consensus process and everyone has to act, which is one reason why, if we wish to be leaders on this, as we have been from the

beginning, it's really important to us that we act and make sure that everybody else does as well.

The CHAIRMAN. A number of the parties have overlapping claims to portions of the Antarctic. Can you tell us how the Protocol addresses those overlapping jurisdictions?

Ms. CLAUSSEN. I think the Protocol has a very clever way of sort of side-stepping all of those issues and making sure that everything is done on a cooperative basis.

You know, of course, that we, ourselves, have not put forward a claim, and the way that we have handled it is to make sure we still have the ability to do that, should it become necessary.

But what we really have here is a genuinely cooperative process and the claims are sort of set aside and everyone is working together to do what really needs to be done here. It's a model.

The CHAIRMAN. In your view, does U.S. prestige internationally suffer if we go yet another year without implementing the provisions?

Ms. CLAUSSEN. Well, I am a strong believer in becoming a part of things so that we can in fact lead and make sure that they are sensible, so I believe if we don't move forward, we just move back a little bit in our ability to really ensure that the right things take place here.

So from our point of view, please do it.

The CHAIRMAN. Are there any changes in the bill that you think need to be made at this point?

Ms. CLAUSSEN. We are happy to accept the bill as it is.

The CHAIRMAN. Okay, very good. We don't often get that, and so—

[Laughter.]

Ms. CLAUSSEN. I hardly ever say it either.

[Laughter.]

The CHAIRMAN. Well, there's been a lot of good work going on amongst all the parties concerned to try to produce that kind of bill, and we thank you for that.

Dr. Lane, you mentioned this briefly in your remarks, but I wonder if you would just reiterate what impact this particular legislation might have on U.S. research efforts in Antarctica?

Dr. LANE. Chairman Walker, we believe this bill really does strike the right balance. The science that goes on down there is completely consistent with keeping the environment in a pristine state. And so we already operate our program in such a way that, as I indicated earlier, that we are consistent with the Protocol and with NEPA as well.

We're very anxious to have this legislation in place. We think that the role that it provides the NSF is a good one, and the partnership that it establishes with other federal agencies will also ensure the best possible protection of the environment while carrying out the important science.

The CHAIRMAN. Let me throw you a softball. You won't get many of those either, but the research down there is expensive. It's logistically taxing to do work in Antarctica.

Why is it important to continue to fund a significant U.S. presence in research in Antarctica?

Dr. LANE. I'll answer from a scientific point of view, and ask my colleague, Eileen Claussen, to add her comment.

Scientifically it is important, I think, for three reasons.

One is that it is an absolutely unique environment on the earth in which to study global processes, and I mentioned global change, ozone hole. That's where that particular interesting ozone hole is located. And other kinds of research activities that can be best carried out there, but effect our understanding of the entire globe, its atmosphere, its oceans. And those are important to us wherever we live.

A second reason is that it's a unique platform to do certain kinds of research that again you can't do in any other inhabited part of the world. The quality of the air, the elevation of the South Pole, the dryness of the air, clearness of the air is such that you can do a kind of astronomy there from the ground that otherwise we have to do in space.

I mentioned the examples of the muon neutrino detection. Because you have the clear ice, you can do that detection there. So it's a unique experimental platform.

And finally, the third item is you have an opportunity to explore a geographical region of the earth that in itself is unique and your example, Mr. Chairman, of those wonderfully comfortable fish that generate their own antifreeze a very good reason.

So for many, many scientific reasons, it's very, very important. Eileen, would you like to add anything?

The CHAIRMAN. Yes, if you would like to comment, Ms. Claussen, on just kind of the geopolitical reasons for being there as well?

Ms. CLAUSSEN. If we're going to move forward in protecting the global environment, we need sound science, and this is a wonderful laboratory for getting sound science.

So I can't tell you how strongly we feel about the importance of continuing activities here.

The CHAIRMAN. Good, thank you very much.

And Dr. Lane, same question to you. Are there any changes that you know of that ought to be made to H.R. 3060?

Dr. LANE. No, Mr. Chairman. We're very pleased with the bill as it stands.

The CHAIRMAN. Thank you very much.

Mr. Brown?

Mr. BROWN. Thank you, Mr. Chairman.

After listening to your tightly focused and yet comprehensive questions, I have absolutely nothing that I can contribute additionally.

[Laughter.]

So I yield back the balance of my time.

The CHAIRMAN. Thank you.

Mr. Ehlers?

[No response.]

The CHAIRMAN. I'm trying to figure out who is here.

Mr. Davis?

Mr. DAVIS. I just have one question.

A lot of the parties to this have overlapping claims to portions of Antarctica. Just tell me again how does this Protocol treaty address that?

Ms. CLAUSSEN. I thought I tried before. Let me try again.

Mr. DAVIS. You tried. I just want to make sure I understand it.

Ms. CLAUSSEN. I mean there are in fact a lot of competing claims. We ourselves did not put forward a claim, neither did the Russians. And so that is the landscape here. The way the Protocol deals with it is simply by establishing a cooperative way and in a simple sense, ignoring the claims. And making sure that we just can continue to work in a positive and constructive way, which is exactly the way it has worked.

We also need to realize that on the one hand, we've got a bunch of countries who have claims, and then we have two that have not, and that balance also works in favor of making sure that the claims issue never really arises, and that people really have in fact the ability to work together.

Mr. DAVIS. Thank you. That's all.

The CHAIRMAN. Mrs. Morella?

Mrs. MORELLA. I'm very excited about this bill finally coming to the hearing point and I hope a mark-up soon, and I thank the Chairman for so arranging it.

He has been to Antarctica. I had the good fortune of going there about a year and a half ago, and I see my loyal guide is here, Dave Stonner, who was with me on that trip.

And so I am an advocate. I feel very strongly about the need for this Protocol, and I know that as leaders, we will get the other five countries to join.

I was particularly impressed with the waste management that went. I mean, anything that goes in, goes out. The fact that the regulations remove just about all of the waste from Antarctica, it went out.

I think it taught me something even when I came back in terms of trying to emulate that.

I realize the need to make sure we don't harass penguins or seals and preserve every species.

I guess really my only question is one who does also believe that this does strike a balance, Dr. Lane.

My question would be, if you don't, if we don't have this, aren't these countries, the 26 countries already following the Protocol? And that frankly what we're doing is codifying? Or do we have problems with some countries not doing it?

Ms. CLAUSSEN. I think in large part they are, but the standards that they work by are not always as stringent as our own. And we think that by the ratification process in bringing everybody into this, we will end up by raising the standard some pretty much to the level that we already use ourselves, but where everyone else is on the margins, maybe not quite as good as we.

So from our point of view, it will actually improve the protection of the environment if we were all to ratify.

Mrs. MORELLA. So you feel they are doing it but we do need to have this intact.

How many countries do have their spots in Antarctica, are represented? I mean maybe they don't all have stations.

Ms. CLAUSSEN. There are 26 countries.

Mrs. MORELLA. Twenty-six, there are no others?

Ms. CLAUSSEN. There are no others and they all have some level of activity, all 26. It varies. Some of it is very small, some of it is quite significant.

Mrs. MORELLA. Do you hear—this doesn't have to do with the bill specifically—but are some of them having trouble with funding? Do you hear about any of them going to withdraw or no one's coming in?

Could you give us just a little synopsis of that status?

Ms. CLAUSSEN. I think some of them are having some funding and I think there is some movement toward multilateral research. One country, for example, is Belgium which once had a much bigger effort, is one of the countries with a claim. It now has a much smaller effort, but it is working with other countries in sending its scientists down there.

So, yes, I think funding in different governments is in different stages.

But I think what you're going to see from that is not a withdrawal of scientists but a sort of multilateralizing of the science effort.

Mrs. MORELLA. At the South Pole where everybody was taking snapshots in that cold weather, I met a man who took a photograph of me who was from Chevy Chase, Maryland. I mean it's just amazing that you'd go to the South Pole and there is somebody who's a constituent.

Well, again, as I say, I'm an advocate and I hope we'll move this bill forward, and I thank you both for the work that you've done on it. And thank you, Mr. Chairman.

Thank you.

The CHAIRMAN. Mr. Gutknecht?

Mr. GUTKNECHT. Thank you, Mr. Chairman.

Maybe this is a little off the beat, but we were talking here about the ozone hole, and these may be the only experts who really who can talk a little bit about it.

Can you share some of your observations, either one of you?

Dr. LANE. Well, Mr. Gutknecht, it is a special part of the globe for the ozone hole. It is a now much studied phenomena. It varies somewhat from year to year, but still shows quite clearly that something attacks the ozone layer seriously in this region of the globe.

And that of course then removes the protective molecules that keep ultraviolet radiation from coming through. Therefore, when there's a hole, the ultraviolet—

Mr. GUTKNECHT. Up to that point, we all know all of that. Now we'd like to know what you think about it.

Dr. LANE. What do I think? Well, it's real as a scientific observation. It's happening, and so the question is, in my own mind, is why is it happening.

So what we're studying is not only that there's a hole there and that it comes and goes seasonally but that we're trying to understand the chemistry that lies behind the destruction of the ozone molecule, and that's an active research effort.

And so my own view is, the more we'll understand about the chemistry, the more we will be able to make the necessary connec-

tions to help us understand the impact of humans on the environment.

Do you have something to add to the ozone hole?

Ms. CLAUSSEN. Well actually I think this year was the largest one that we've had, and we would think that the science would suggest quite clearly that it's the continuous buildup of chlorofluorocarbons and other chemicals that destroy the ozone layer.

Even though we in the developed world have already stopped producing those chemicals, there's a long lead time, and so we expect actually to see continued destruction of the ozone layer and of the hole until the cycle turns all the way around and we start to see some healing, probably not for another 20 or 30 years.

Mr. GUTKNECHT. But you do expect it to turn around?

Ms. CLAUSSEN. I'm not a scientist.

Mr. GUTKNECHT. What causes that expectation? Are you just an incurable optimist, or?

Ms. CLAUSSEN. No. I mean, if you subscribe to the theory which the world scientists have, and as you know, the scientist who really made the initial connection between CFCs and the ozone layer recently received the Nobel Prize, if you accept that, we can chart exactly what's going to happen to those chemicals over the next 20 or 30 years, and the amount produced is going to be less and less, the amount in the atmosphere is going to be less and less, and we would expect to see a healing.

Dr. LANE. Mr. Gutknecht, I have a colleague with me, Dr. Neal Sullivan, who directs our whole polar program, and could share with you now, or in writing, or at another time, some more details about the implications of the research.

Mr. GUTKNECHT. I don't want to take too much of the Committee's time, but it is something that we read an awful lot about, and constituents ask about, so if one of you could just send me a letter or maybe to the entire Committee, I think it would be very helpful.

Dr. LANE. We'll certainly do that.

Mr. GUTKNECHT. Because I think, I do support the research that's going on, the more we learn the more we know, I think the better we can deal with it. But, you know, this Committee especially, it's very helpful.

Dr. LANE. We will certainly respond for the record.

Mr. GUTKNECHT. Thank you.

[The following information was received for the record:]

#### THE ANTARCTIC OZONE HOLE

The Antarctic ozone hole was first reported in 1985 by Joe Farman and his colleagues from British Antarctic Survey (BAS), about 10 years after recent Nobel Laureates Sherwood Rowland and Mario Molina had predicted that chlorine from manmade chlorofluorocarbons could destroy stratospheric ozone through a catalytic process. This prediction was of great importance because the existence of life on the surface of the earth depends on the ultraviolet filtering properties of ozone. The ozone hole discovery was a great surprise for two reasons, first because it was much more severe than even the most pessimistic predictions of the models and because it occurred only in the austral spring above Antarctica. The fact that BAS was making observations from Antarctica probably advanced by many years the discovery of the hole, thus pointing out the importance of maintaining Antarctic research.

The U. S. Antarctic Program (USAP) was able to respond very quickly to the BAS report, delivering to South Pole equipment and helium necessary for NOAA to fly

ozonesonde balloons throughout 1986 and, most importantly, we were able to get a team of researchers to McMurdo Station in late austral winter of 1986 to make measurements of the details of the chemistry in the depleted region. The first National Ozone Expedition (NOZE-1) was put together by NSF, NASA and NOAA and included both government laboratory and academic researchers. The results of NOZE-1 (and NOZE-2 the following year) established beyond doubt the dominant role that chlorine plays in the destruction of ozone and, in turn, provided the basis for the Montreal Protocol, the first multinational treaty concerning environmental protection. Without the preexisting facilities and capabilities of USAP it would have been impossible to develop the data necessary for the policy makers to forge this landmark treaty and, much more importantly, mankind would have delayed actions that have protected the ozone layer from more extreme damage.

Since the days of NOZE, NSF and our sister agencies have been working hard to elucidate the details of the causes of the ozone hole and to look for effects of excess ultraviolet radiation on the biota which live in Antarctic waters and the surrounding land areas. In support of this there is a coordinated program consisting of several continuing monitoring activities as well as a number of research projects aimed both at biological effects and atmospheric chemistry and dynamics.

In response to the discovery of the Antarctic ozone hole, the USAP initiated the NSF UV-Radiation Monitoring Network to directly measure UV-radiation reaching the earth's surface. Instruments are located at the three U.S. Antarctic stations as well as in southern Argentina and in Alaska. Data from the Antarctic clearly show increases in UV radiation during ozone hole events.

The international scientific community, through periodic United Nations Environmental Programme/World Meteorological Organization "state-of-the science" assessments, has established beyond a doubt that the main cause of the ozone hole is catalytic chemistry involving chlorine from manmade chemicals. The reactions proceed very rapidly above Antarctica because of the presence of polar stratospheric clouds (PSC), a polar phenomena caused by the very low stratospheric temperatures reached during the winter. These PSCs provide surfaces on which chemical reactions occur that increase the amount of chlorine that occurs in the active, ozone-destroying form. It has also been shown that in addition to the PSCs, aerosols from volcanoes accelerate the chlorine chemistry that destroys ozone. This makes the need to reduce the chlorine burden of the atmosphere particularly urgent because it demonstrates that there is a potential for dramatic ozone depletion above non-polar regions. Indeed, rather severe reductions in total column ozone were measured above the US following the 1991 eruption of Mt. Pinitubo.

The effect of increased UV-radiation on Antarctic organisms has been a major focus of research. It has been shown that the growth of microscopic marine plants, called phytoplankton, inside the ozone hole decreased 6% to 12% compared to phytoplankton growth under normal UV-radiation concentrations. The phytoplankton form the base of the marine food web. Even small decreases in growth rate due to increased UV-radiation could adversely affect invertebrate larvae, fish, crabs, birds and mammals, which could in turn affect the global food supply.

During the next decade, if there is full compliance with the international agreements of the Montreal Protocol, the abundances of atmospheric chlorine and bromine will reach the highest levels that the planet will have to endure. Over the next ten years the Earth's ozone layer will be at its most vulnerable. Ozone research, like any scientific endeavor, has encountered and will continue to encounter the unexpected. For example, the Antarctic ozone hole was not predicted, and its discovery and explanation revealed a new process that was previously unknown to atmospheric researchers. There may well be others. For example, studies of the 1991 eruption of Mt. Pinitubo have shown that volcanic particles served to enhance, by an additional 2% for a few years, the ozone depletion caused by manmade chlorine compounds. What would be the effects of a major volcanic eruption during the "vulnerable decade?" Another issue for the future is the fact that at mid-latitudes, where most of the world's human population resides, the observed downward trends in ozone concentrations are twice as large as those predicted. The reasons for this difference, and what it could mean for our understanding of future ozone losses, are not yet clear. As another example, Antarctic research has shown that bromine from anthropogenic chemicals (methyl bromide and the Halon class of fire suppressants) is also responsible for some of the ozone hole, though the quantitative aspects are not yet clear. Understanding the long term development of the phenomena requires continuing research as does the effect of external drivers such as the solar cycle and the quasi-biennial oscillation, a tropical, stratospheric phenomena which exhibits reversals of high altitude winds on an approximate 26 month cycle and which is well known to affect global ozone levels.

While it is already well known that UV-radiation can damage cells and tissues of organisms and can negatively affect various biological processes, the negative effects to whole ecosystems is less clearly understood. Future research on UV-radiation effects should include studies at both the levels of organization in order to fully evaluate the global impact of stratospheric ozone depletion.

The CHAIRMAN. The gentleman from New Mexico, Mr. Schiff.

Mr. SCHIFF. Thank you, Mr. Chairman.

Dr. Lane, a number of years ago, I moved from Chicago, Illinois to Albuquerque, New Mexico for a little bit warmer weather so I'm not immediately intending to visit Antarctica. But I would like to at some point.

I have one question. And that is, I have a general concern about, are other countries doing their fair share of commitment of financial resources to research, which ultimately benefits all of mankind?

I feel that way in various areas where I've looked at what the United States is spending in areas from space research to high energy research, and at times, I'm not convinced that other countries are doing their fair share when it seems to me ultimately everyone will share in the benefits of this research.

Now maybe their view is the same in certain respects. But specifically since we're talking about Antarctica, my question is, in your judgment, is there a reasonable fair share of allocation of scientific research.

And I should add, that's a two way street. Maybe I'm mistaken in the implication of my question. Maybe other countries proportionally are doing more than we are.

But the question I'm raising is, are the industrialized countries of the world making a fair share commitment to Antarctic research which ultimately will benefit everybody in the world?

Dr. LANE. Mr. Schiff, this is a general question is one of course we talk about a good deal as well as we look for increased opportunities for international cooperation in all kinds of scientific facilities.

In the Antarctic in particular, of course many countries have their own facilities but at the South Pole, where the U.S. maintains the infrastructure, we spend about what, 25, 30 percent of our total, the total continental alliance in the Antarctic, so that's U.S. investment as a fraction of the total.

But your question, Mr. Schiff, is are we spending substantial amounts of money I guess in support of other nations doing science in our facilities?

Mr. SCHIFF. Well, however it's done, is everybody doing making a fair contribution?

[The following response was received for the record:]

#### **Are the other nations doing their fair share in Antarctica?**

Of the 43 Antarctic Treaty nations, 26 have achieved consultative (voting) status by meeting the treaty's requirement that they perform "substantial scientific research activity there [in Antarctica], such as the establishment of a scientific station or the despatch of a scientific expedition."<sup>1</sup> The other 17 Antarctic Treaty nations

<sup>1</sup> The 26 consultative parties consist of the treaty's 12 original (1959) signatories and another 14 nations that acceded to the treaty after it entered into force in 1961. The treaty does not oblige the 12 original signatories to conduct substantial scientific activity in order to sustain their consultative status, but all of them currently do.



are accedent (nonvoting) nations and do not perform substantial scientific research activity in Antarctica.

Research by the consultative nations is achieving scientific goals beyond the capability of any single nation. Much of the work is performed separately, as, for example, collecting weather data. More complex projects tend to be carried out cooperatively among nations. An example is a five-nation, 2-year project drilling an ocean-bottom sedimentary core from a platform on coastal sea ice. In cooperative projects, each participating nation delivers a negotiated component. Research results are made freely available as required by the treaty. This sharing of research results contributes greatly to the validity of U.S. scientific research in Antarctica.

International cooperation is extensive, and opportunities are implemented through the Scientific Committee on Antarctic Research (SCAR) of the International Council of Scientific Unions (nongovernmental), the annual Antarctic Treaty consultative meetings (government-to-government policy decisions), the Council of Managers of National Antarctic Programs (a U.S. initiative), and the Council's Standing Committee on Antarctic Logistics and Operations. Individual scientists initiate much cooperative research among nations.

A few Antarctic Treaty countries provided their antarctic budget figures in response to a request NSF made to all of them in late 1995. These figures in most cases are not comparable to the U.S. figures because they represent only operational costs, or only research costs, or costs for research in both polar regions, or only partial costs. The wealthier countries tended to provide more complete estimates. Keeping in mind the limitations inherent in these rough figures, we calculated the portion of a country's gross domestic product that is devoted to its antarctic program. The U.S. portion is 0.0031 percent. That is, 0.0031 percent of the U.S. GDP in fiscal 1995 was allocated to the U.S. Antarctic Program. Germany's portion is 0.0059 percent; U.K., 0.0036 percent; Italy, 0.0036; Japan, 0.0016; Russia, 0.0014; France, 0.0009. These figures, though certainly not definitive, suggest that the other developed countries are contributing their fair share in Antarctica. The smaller or less-developed countries tend to devote higher percentages of their GDPs to antarctic research.

Dr. LANE. Our sense is that at this point in time, it's certainly a fair contribution, because you really have to balance it off against the other scientific facilities that our scientists are using in other parts of the world.

Said another way, I think if we go the direction of requiring payment for services rendered for all of our facilities, the telescopes, the accelerators, the facilities in the South Pole, then the quality of the science that gets done is likely to suffer as a result of that.

It is simply the case now that for most of the facilities in the world, scientific facilities in the world, the science that gets done there is determined based on the merit of the scientific idea, not on the U.S. being able to have a certain fraction of the time at the facility or another country having a certain fraction of the time at the facility.

So the question is a larger one, it's a very important one as funds get tight, and as we want to ensure we get the best science out. And my view is that the more we move in the direction of paying explicitly for certain fraction of the facility, country by country, we will end up with less, with a lower quality science done overall.

Mr. SCHIFF. Well, I just want to express a general concern, and I understood what you said, but I want to express a general concern that if any nation, whether it's the United States or any other country, bears an undue proportion of the cost, whether it is military peacekeeping, humanitarian relief, or basic scientific research than other countries, those—and here I'm referring to industrialized countries—those industrialized countries will put the unused resources into things like market competitiveness and the idea of winning the marketplace battles, because some countries are put-

ting more than their fair share into common interest kinds of projects.

And I just think that everything should be equally or proportionally, I guess I should say, contributed across the board.

Now if there's a complaint about the United States not doing that, I would be interested in that complaint. But I would just hope that every industrialized country is proportionally supporting the research in Antarctica since that's the subject today.

Thank you, Mr. Chairman. I yield back.

The CHAIRMAN. Thank you.

The gentleman from Pennsylvania, Mr. McHale.

Mr. MCHALE. Thank you, Mr. Chairman.

I appreciate the testimony of the witnesses, and thank you very much for being here today.

I think implicit in your testimony up to this point is that there is virtually universal support for this legislation. When I take a look at the cosponsors on the bill, I see Chairman Walker, former Chairman Brown, Congresswoman Morella, Congressman Rohrabacher, and 16 other cosponsors, it's rare that we have such a broad consensus of both partisanship and ideology in terms of support for a single piece of legislation.

And I think throughout your testimony you've made it clear that you are enthusiastically supportive of the legislation.

Implied is that there really is not opposition.

Allow me to go to that implication and allow you to state that on the record.

Ms. Claussen, I would ask you, are you aware of any organized international opposition to the legislation?

And then I would ask Dr. Lane if he is aware of any organized opposition within the scientific community.

During the next panel of witnesses, I think we'll hear similarly from the environmental community. But in terms of any international opposition, I would be grateful for your comment, Ms. Claussen.

In terms of the implied but I hope soon to be stated virtual unanimity of the scientific community, I would welcome your comments, Dr. Lane.

Ms. CLAUSSEN. Congressman, it's easy for me to say. The answer is no. No organized opposition, no opposition that we are aware of at all. Everyone is very supportive of this treaty and implementing it, and would love to see us in it as a party as well. No opposition.

Mr. MCHALE. Receiving that kind of response to that type of question is a rare moment before this Committee.

[Laughter.]

Mr. MCHALE. Dr. Lane?

Dr. LANE. Mr. McHale, we are unaware of any organized opposition from the scientific community as well.

Mr. MCHALE. On that note of cooperation, Mr. Chairman, I thank you for the opportunity to present the questions, and my hope is that we can move swiftly in the passage of the bill and its ultimate enactment into law.

Thank you.

The CHAIRMAN. I thank my colleague from Pennsylvania.

Mr. Sensenbrenner, did you wish to ask some questions?

Mr. SENSENBRENNER. I can say, no questions, Mr. Chairman, in fewer words than Mr. Brown.

[Laughter.]

The CHAIRMAN. Thank you, Mr. Sensenbrenner.

Mr. Bartlett, questions?

Mr. BARTLETT. No questions.

The CHAIRMAN. The gentleman passes.

With that, we have completed the first panel. We thank you very, very much, and we look forward to your continued assistance as we move this through.

We'd like to build a little fire under the Senate. We think we're going to get it out of the House pretty expeditiously but any help we can get in building a fire over in the Senate to move forward on it will be much appreciated as well.

Thank you very much for your testimony.

I'd now like to call the second panel.

Ms. Kathryn S. Fuller, President of the World Wildlife Fund.

And Dr. Robert H. Rutford, who is with the Program of Geosciences at the University of Texas at Dallas.

We ask you to join us at the witness table please.

[Pause.]

And, Ms. Fuller, we'll begin with you. We'd be happy to have any testimony that you might wish to present to the Committee at this time.

#### **STATEMENT OF MS. KATHRYN S. FULLER, PRESIDENT, WORLD WILDLIFE FUND, WASHINGTON, DC**

Ms. FULLER. Thank you very much, Mr. Chairman.

I'm here today not only on behalf of the World Wildlife Fund, but also on behalf of the Antarctic and Southern Oceans Coalition which is a group of 200 organizations more or less internationally and about 26 large organizations here in the United States.

And I am here in enthusiastic support of H.R. 3060, the legislation to implement the Protocol to the Antarctic Treaty on Environmental Protection.

Let me speak first as a life long conservationist—and a professional conservationist now for about 20 years—in saying that Antarctica truly is a remarkable biological resource.

We've already heard from the previous witnesses about the wildlife there, about penguins and seals and whales.

Let me add that the sanctuary supports the blue whale, which many think is the largest creature ever to have existed on our planet. There are probably only three or four hundred blue whales left at this time. So the Antarctic Sanctuary for Whales is very important from that perspective.

The Antarctic, though, in addition to large creatures, supports an extraordinary ecosystem, phytoplankton, the crill that feed upon phytoplankton, the small shrimp-like creatures that themselves make up one of the most important global food chains on the earth.

So from a conservationist's perspective, there is truly a great deal at stake in the Antarctic, and ironically the important scientific characteristics that we've all heard about already too, its value as a laboratory, holds some of the seeds of potentially the Antarctic's undoing.

Pressures on the Antarctic from human activity have risen fairly dramatically since research activities intensified now over the last say 40 years.

There are more scientific stations on the continent, housing more scientists, support personnel, and in addition, the number of tourists is increasing quite rapidly.

That produces not only an important constituency in favor of the Antarctic but additional pressure on a very fragile environment.

And so the need to move forward on implementing the Protocol really is pressing. And the United States, as has been said earlier, has a crucial role to play in this regard.

We have been a leader in Antarctic conservation for decades. We have been leaders in environmental stewardship. We have helped to bring along other nations of the world.

We do now, if the delegates, if the U.S. delegation to the upcoming meeting is in fact able to say to the other uncommitted countries that the United States is going to move forward with implementation of the Protocol this session, or is likely to do so, then I too believe that the likelihood of moving the remaining consultative parties that have yet to finish the ratification process is good.

Many have played very important roles in crafting the compromise that's set forth in H.R. 3060 from the National Science Foundation and the State Department to the Antarctica Project and Greenpeace.

And in addition, Mr. Chairman, your help in moving the implementation process forward by sponsoring H.R. 3060 and holding these hearings has really been terrifically valuable and I want to thank you on behalf of the environmental community for doing that.

So I would just urge that the Committee vigorously pursue passage of this legislation so that the final stages of ratification of the Protocol can go forward.

All of us in the environmental community look forward to continued cooperation, both with the Administration and with the Congress on Antarctic conservation, safeguarding it for our future.

Thank you.

[The prepared statement of Ms. Fuller follows:]

STATEMENT OF KATHRYN S. FULLER

PRESIDENT, WORLD WILDLIFE FUND

BEFORE THE

COMMITTEE ON SCIENCE

U.S. HOUSE OF REPRESENTATIVES

APRIL 18, 1996

Mr. Chairman, thank you for the opportunity to testify today on H.R. 3060, "The Antarctic Environmental Protection Act of 1996" which would implement the Protocol to the Antarctic Treaty on Environmental Protection. The Protocol seeks both to provide comprehensive environmental protection for Antarctica and to ensure that important international scientific research and cooperation in Antarctica continue. Passage of H.R. 3060 and implementation of the Protocol will help safeguard Antarctica's pristine environment and provide critical, renewed momentum to the handful of other countries that have not yet ratified the Protocol.

The Antarctic Environmental Protocol will enter into force when ratified by all 26 of the Antarctic Treaty Consultative Parties. Six countries have yet to complete the ratification process, including the United States. Although the U.S. signed the Environmental Protocol nearly five years ago and the Senate gave its advice and consent in 1992, the passage of implementing legislation is necessary in order to submit the instruments of ratification to the Department of State, which receives the instruments of ratification of all nations on behalf of the U.S. as the depository government. Enactment of implementing legislation has been delayed by negotiations regarding striking a balance with the management of research programs that will ensure strong protections for the Antarctic environment.

Many have played important roles in crafting the compromise set forth in H. R. 3060, from the National Science Foundation and the State Department to The Antarctica Project and Greenpeace. In addition, Mr. Chairman, your help in moving the implementation process forward by sponsoring H.R. 3060 and holding this hearing has been invaluable. World Wildlife Fund, on behalf of the members of the Antarctic and Southern Ocean Coalition, strongly supports H.R. 3060 and urges its expeditious passage.<sup>1</sup>

## I. BACKGROUND

Antarctica is among the last great wildernesses and a precious global resource. The continent is larger than the United States and Mexico combined and represents 10% of the Earth's land mass. Ice and snow averaging over a mile in thickness cover 98% of the continent, storing an estimated 90% of the Earth's fresh water. Antarctica possesses an abundance of fish and wildlife and plays a central role in regulating the Earth's environmental processes by influencing global tides, sea levels, and atmospheric processes. The untrammelled nature of the region also provides a research environment for understanding and monitoring global warming, ozone depletion, and atmospheric pollution.

Scientific interest in Antarctica dates back to the late nineteenth century, when several nations commenced explorations of the continent. In the first half of the 20th century, seven countries<sup>2</sup> claimed sovereignty over land in Antarctica. The United States and the former Soviet Union made no territorial claims in Antarctica and did not recognize the claims of other nations.<sup>3</sup>

The International Geophysical Year (1957-58) saw an increase in Antarctic studies. Participating countries recognized the importance of the work then undertaken and the need for increased international cooperation in the region. The United States proposed a treaty that would preserve the continent as an international scientific laboratory and ensure its use for peaceful purposes. The Antarctic Treaty, the cornerstone of the subsequent treaty system governing the area, was signed in 1959 and entered into force on June 23, 1961. The Antarctic Treaty establishes the international legal framework for Antarctica and guarantees free access and research rights to the world community.

The meetings of the Consultative Parties to the Antarctic Treaty have generated additional international agreements regarding the preservation and conservation of living resources. The Parties negotiated Agreed Measures for the Conservation of Antarctic Fauna and Flora during the 1960s and supplemented those measures in 1972 and 1985. As it now stands, the agreement forbids killing, capturing, or interfering with native birds or mammals without a permit, obliges Treaty members to minimize marine pollution and harm to Antarctic living conditions, protects biological communities within Specially Protected Areas, and prohibits importation of nonindigenous species except under permit. Congress provided statutory enforcement authority for these measures through passage of the Antarctic Conservation Act of 1978, under which the Director of the National Science Foundation promulgates regulations and issues permits.

In addition, the Consultative Parties negotiated the Convention for the Conservation of Antarctic Seals to prevent over-harvesting. The Convention, which was signed in 1972 and entered into force in 1978, prohibits the killing or capturing of

<sup>1</sup>The U.S. members of the Antarctic and Southern Ocean Coalition are: American Cetacean Society, American Littoral Society, Animal Welfare Institute, The Antarctica Project, Cetacean Society International, Defenders of Wildlife, Earth Island Institute, Earthkind, Friends of the Earth (USA), Friends of Whales, Greenpeace (USA), The Humane Society of the United States, International Fund for Animal Welfare, Monitor Consortium, Monitor International, National Audubon Society, National Parks and Conservation Association, National Wildlife Federation, Natural Resources Defense Council, Ocean Alliance, Sierra Club, Sierra Club Legal Defense Fund, The Wilderness Society, Windstar Foundation, World Society for Protection of Animals, and World Wildlife Fund.

<sup>2</sup>Argentina, Australia, Chile, France, New Zealand, Norway and the United Kingdom.

<sup>3</sup>However, both have "reserved" their basic historic "rights" to assert claims on the continent.

elephant, fur, and Ross seals in Antarctica and establishes annual quotas on the exploitation of leopard, crabeater, and Weddell seals.

In the 1970s, the Treaty Parties developed the Convention on the Conservation of Antarctic Marine Living Resources in response to heavy fishing and the depletion of fish stocks. It entered into force in 1982 and encourages the study and conservation of living resources within Antarctica's overall marine ecosystem. The United States ratified this convention in 1984 when Congress passed the Antarctic Marine Living Resources Convention Act, which vests regulatory authority in the Secretary of Commerce.

The environmental community has long valued the unspoiled beauty of Antarctica with its wealth of wildlife and recognized the need to preserve the region from the dangers of over-development and exploitation for profit or political purposes. We have sought to prevent over-harvesting of the region's marine resources, to protect Antarctic wildlife and wilderness, to monitor environmental impacts from scientific stations, and to emphasize the overall need to keep environmental protection as a top priority within the Antarctic Treaty system.<sup>4</sup> In the 1980s, conservation organizations from around the world united with the goal of providing Antarctica's environment with longlasting and comprehensive protection as a world park in which human activities would have minimal impacts on Antarctica's fragile environment.

At that time, the Parties to the Antarctic Treaty were negotiating the Convention on the Regulation of Antarctic Mineral Resource Activities (CRAMRA), which was signed by the Consultative Parties in 1988. Under the auspices of the Antarctic and Southern Ocean Coalition, a group of over 200 organizations worldwide (including the 26 in the U.S.), the environmental community focused its efforts on defeating CRAMRA and replacing that agreement with a comprehensive environmental protection regime, including a permanent prohibition on commercial mineral resource activities in Antarctica. This effort led to Congressional passage of the Antarctic Protection Act of 1990 (APA), which prohibits commercial resource activities by U.S. nationals on an interim basis pending entering into force for the U.S. of an international ban on mineral activities as foreseen by the APA.

The environmental community therefore welcomed the efforts of the Antarctic Treaty System nations during the 1980s to negotiate a comprehensive environmental protection agreement. Those negotiations resulted in 1991 in the signature by the 26 Antarctic Treaty Consultative Parties of the Protocol to the Antarctic Treaty on Environmental Protection. The Protocol and its annexes are designed to protect the Antarctic for its wilderness and aesthetic value and for scientific research. They establish guiding environmental principles, a Committee on Environmental Protection to advise the Antarctic Treaty parties, and mandatory dispute settlement procedures. They also establish new, protective standards governing mineral resource exploration and development activities, environmental impact assessments, conservation of Antarctic flora and fauna, waste disposal and management, and prevention of marine pollution. A fifth annex, added to the Protocol shortly after it was signed, establishes a system of protected areas in Antarctica.

The Protocol has environmental limitations, however. It establishes only minimal control on incineration and only calls for negotiations rather than resolving the issues of liability for environmental damages and institutional inspection authority to monitor Protocol compliance. Nonetheless, we in the environmental community consider the Protocol to be a significant step forward.

## II. THE PRESSING NEED FOR IMPLEMENTING LEGISLATION

The Antarctic holds some of the most pristine and biologically unique ecosystems on Earth. The southern ocean is virtually unmatched as a font of ocean productivity; its extraordinary phytoplankton and krill support much of the ocean food chain globally and, within the new circumpolar Sanctuary chartered under U.S. leadership by the International Whaling Commission, it provides safe harbor to some of the most critically endangered marine mammals. The magnificent blue whale, believed to be the largest creature ever alive, survives in the southern ocean today in relic numbers, dwindled to only several hundred individuals as a result of years of overexploitation. From a conservation perspective, there is truly much at stake in the Antarctic.

During the last 35 years, however, pressures on the Antarctic environment have increased dramatically. Countries have established increasing numbers of scientific

<sup>4</sup> In support of these efforts, since 1985 Greenpeace has carried out eight annual expeditions to Antarctica to observe and document the impacts of human activities in the region, including fisheries operations, tourist activities, and the activities of the national Antarctic stations. In addition, from 1987 until 1992, Greenpeace operated the only year-round, nongovernmental base in Antarctica. Reports from the expeditions and base have been instrumental in heightening public awareness of environmental problems in Antarctica.

bases on the continent that house scientists and support personnel conducting research there. In addition, the number of tourists visiting Antarctica each year continues to grow. During the 1994-1995 season, approximately 8,000 tourists visited Antarctica; the preliminary numbers for 1995-1996 indicate upwards of 9,000 visitors. Increasing tourism poses potential environmental threats, including ship-based pollution and impacts to land fauna and flora from repeated landings at the same sites. More research is needed to assess whether some of these landing areas, particularly nesting areas for seals and penguins, have begun to show evidence of frequent human visitation.

Enactment of the legislation to implement the Protocol at this time is crucial to prevent degradation of Antarctica's pristine environmental state and is in keeping with a tradition of U.S. leadership in antarctic activities and policy for the past 35 years. Today, the United States maintains the single greatest presence in Antarctica and conducts the largest number of research activities there. By passing implementing legislation, the U.S. will meet its obligation as a steward of the Antarctic environment and will underscore its commitment to protect the biological diversity and wilderness of Antarctica. Passage of implementing legislation by the United States will also mitigate any adverse environmental consequences associated with scientific activities conducted on the continent.

Not only will enactment of implementing legislation provide a much needed framework for U.S. activities in the Antarctic, it will also provide critical momentum to the international ratification process. The next meeting of the Consultative Parties to the Antarctic Treaty is scheduled to take place in the coming weeks. If the U.S. delegation can convey to the other parties the strong likelihood that Congress will enact implementing legislation during this session, this may positively influence the other five countries that have yet to complete the ratification process.<sup>5</sup> In addition, H.R. 3060 will serve as a model for domestic implementing legislation in countries that have ratified the Protocol but have not enacted enabling legislation.<sup>6</sup>

Importantly, the Protocol allows scientific activities to continue, but limits adverse environmental effects by requiring that research plans take into consideration prior impact assessments. The environmental community recognizes the significant scientific knowledge to be gained from continued monitoring and evaluation of natural phenomena in Antarctica. The information gleaned from this research will ultimately benefit us all by increasing our understanding of the functioning and health of our planet. Far from putting a stop to scientific research activities in Antarctica, the safeguards embodied in the Protocol will allow scientific research to continue while enhancing the quality of the research environment. Entry into force of the Protocol should also encourage greater support of cooperative science programs among nations, thereby decreasing the environmental impacts associated with multiple support facilities. The result will be greater protection of the Antarctic environment and enhanced quality of scientific research conducted in Antarctica.

Agency implementation of the Protocol's requirements is, of course, a vital element in attaining these ends. The National Science Foundation (NSF), the major U.S. actor in Antarctic research, has responsibility both to implement and enforce the Protocol and to execute research programs. At previous hearings on implementing legislation, the environmental community had urged that these responsibilities be kept distinct.

We recognize, however, that the current leadership at NSF has taken important steps to correct past problems and is implementing sound policies for the future. For instance, NSF has made significant strides in improving its waste disposal and recycling operations, and has upgraded its fuel-handling capabilities and revamped its storage facilities. NSF regulations mandating waste handling procedures and promulgating rules to designate and control the release of pollutants in the Antarctic implement the Protocol's requirements. In addition, the 1993 statement by the Director of the Office of Polar Programs that incineration will no longer be the preferred waste disposal method in the Antarctic reaffirms NSF's commitment to sound environmental management in the future. We are therefore satisfied that NSF can successfully meet its legal obligations under the Protocol with regard to the scientists and activities it supports as well as adequately monitor its own acts and omissions.

Additional positive aspects of H.R. 3060 include its provisions for consultation and concurrence with other federal agencies in the permitting and regulatory process and its requirement that U.S. Environmental Impact Assessments under the Proto-

<sup>5</sup>In addition to the U.S., Belgium, Finland, India, Japan, and Russia have not ratified the Protocol.

<sup>6</sup>Only seven nations have ratified with implementing legislation: Australia, New Zealand, Sweden, Germany, the United Kingdom, Norway, and the Netherlands.

col be implemented in accordance with the National Environmental Policy Act of 1969 (NEPA). Compliance with the NEPA process will ensure consideration in the planning process of all reasonable and practical alternatives. We also accept H.R. 3060's exemption from NEPA for activities carried out jointly by the U.S. with another country, since we anticipate that the Protocol's environmental impact assessment provisions will be followed by the lead nation when a cooperative activity is proposed.

### III. CONCLUSION

The Treaty Parties' commitment to "the comprehensive protection of the Antarctic environment and its dependent and associated ecosystems" is the beginning of a new period in Antarctic policy and its negotiation is a credit to the Consultative Parties. The millions of members of World Wildlife Fund and of the other members of the Antarctic and Southern Ocean Coalition are eager to work with the Treaty nations to implement the Protocol's provisions. Yet ratification of the Protocol has remained elusive for over four years. Until it is implemented fully, the Protocol cannot secure comprehensive protection for the Antarctic environment and safeguard the region's global scientific status.

Fortunately, there is broad, bipartisan agreement in the United States on the need to act now to protect the Antarctic environment. It is an issue that has consistently enjoyed bipartisan support. The Environmental Protocol itself is a direct result of the Antarctic Protection Act of 1990, which passed with virtually unanimous support. H.R. 3060 boasts an impressive bipartisan list of cosponsors and, in addition to our coalition, currently has the support of the scientific community as a whole, the National Science Foundation, and the Administration.

By moving forward with H.R. 3060, the United States can play an influential role in realizing the potential of the Protocol. We therefore urge your Committee to vigorously pursue passage of H.R. 3060 and complete the final stages of the ratification process. The environmental community looks forward to continued cooperation with the Congress and the Administration to achieve our common goal of safeguarding the Antarctic.

The CHAIRMAN. Thank you very much.

And you had submitted more comprehensive testimony which is excellent testimony. And without objection, that will be entered into the record at this point.

Ms. FULLER. Thank you, Mr. Chairman.

The CHAIRMAN. I now recognize Dr. Rutford. Thank you for being with us.

### STATEMENT OF DR. ROBERT H. RUTFORD, EXCELLENCE IN EDUCATION FOUNDATION CHAIR, PROFESSOR OF GEOSCIENCES, UNIVERSITY OF TEXAS AT DALLAS

Dr. RUTFORD. Thank you, Mr. Chairman.

I come to you as a general representative of the Antarctic science community. I first went to Antarctica in 1959 as a graduate student, did my PhD dissertation on the Ellsworth Mountains in the continent, and last returned to Antarctica in January of 1995 to conduct research in the Royal Society Range across from McMurdo Station.

The passage of this piece of legislation, H.R. 3060, will enable the United States to become a party to the Protocol. The environmental Protocol reinforces the role of Antarctica as a place for science of global significance and for peaceful purposes. It further reflects the linkage between the protection of the Antarctic environment and the future conduct of science on the continent.

This linkage has long been recognized by the scientific community. The scientific group that came together to plan the International Geophysical Year in the early 1950s became the Scientific Committee on Antarctic Research following the International Geo-



physical Year, and that group was the precursor to the Antarctic Treaty group that came together in 1960-61.

So that the scientific community has long been involved and SCAR has been the link between the scientific community and the Antarctic Treaty mechanism.

The Scientific Committee on Antarctic Research is a non-governmental body and it links the science programs not only into the treaty mechanism but among countries, among all the countries in Antarctica. It is the international organization that speaks for science internationally.

Here in the U.S., the Polar Research Board of the National Academy speaks, represents and serves as a U.S. National Committee, and I'm the delegate from the U.S. to the Scientific Community on Antarctic Research (SCAR).

We've heard about a number of agreements and conventions that exist at the present time, and I would simply point out to you that in most, if not all of the cases, those kinds of agreements were promulgated either as a result of SCAR recommendations or they were accompanied by corresponding advice from SCAR.

So that the ecosystem approach embodied in CCAMLR which is one of the conventions under the treaty, grew out of a conference sponsored by SCAR in 1976.

In 1984, SCAR gave scientific basis for the environmental impact assessment and monitoring provisions that are found in environmental protocol.

And just recently completed is a second of two meetings sponsored by the Scientific Community on Antarctic Research and the Council of Managers of National Antarctic Programs dealing with the whole question of monitoring, which is contained within the Environmental Protocol.

The Protocol provides a blueprint for conduct of science and science support in the Antarctic. Of particular interest to the scientific community are the annexes to the Protocol.

The question has been raised or has been asked, what was the involvement of the scientific community in writing the annexes. I was privileged to be in Vina del Mar when those annexes were written, and I can assure you that the voice of the scientist was heard.

The need for the U.S. to implement the Protocol is compelling. We have long been a leader in science in Antarctica and in fact we have long been a leader in the push for protection of the Antarctic environment. We are now lagging behind.

I can't emphasize enough how important the role of the U.S. in the development of the conventions and agreements in the Antarctic and the conduct of research there.

Now one of the specific questions in your letter to me, Mr. Walker, was what's the impact on the scientists. Let me answer that because I've been there recently and I can tell you.

You've heard about the efforts that NSF has made to increase efficiencies and from the scientific standpoint, one of those has been to a shifting of how they program people in and out of the Antarctic, which has resulted in fewer people going to the Antarctic under the U.S. program, but more scientists at the same time.

Conservation efforts have reduced fuel consumption, and you've heard about the recycling of waste and the environmental officers.

From my point of view, I can say this. That when we go into the field, we operate just as Mrs. Morella does now. We've got a bucket for the glass and a bucket for the plastic and a bucket for this and a bucket for that and a bucket for the human waste of various kinds, and it'll all come out.

Now does this cause us a problem? Initially certainly it causes a problem until you get into the swing of things. And once you get into the swing of things, it works out fairly well.

And pretty soon the effort becomes not just to recycle the stuff we've taken in, but as you visit old sites that were occupied years ago, the effort to clean them up, and when flying in helicopters, if you notice a fuel drum that was left 25 years ago, to mark it so the helicopter pilots can pick it up at a later date.

And I can honestly say that I think that the scientific community has bought into the Environmental Protocol and into the implementation of a Protocol in a hundred percent effort.

Now, in terms of the policy implications of the Protocol, I would point out to you that the Polar Research Board, at the request of the Department of State, did a very detailed study, established an ad hoc committee to do this, and under one of the chapters in their report, and that chapter was entitled "Implementation of the Environmental Protocol," one of the subsections in that report is called "Environmentally Responsible and Science Legislation."

And further subsections under that section are headed by the words "clarity," "flexibility," "simplicity," and "practicability."

And those certainly refer to this legislation. And I would hope that they also refer to the regulations which are drafted to implement this legislation.

I sent copies of the bill, or copies have been distributed to the scientific community and to date I have heard only positive responses, and they are all impressed by the clarity, simplicity, and practicability of this piece of legislation.

Because we are the ones, we're at the bottom line. We are the ones that have to live with it, and I think that everybody is exceedingly pleased with the bill as it stands.

I'm just here today to urge you and your colleagues to act on this bill, to get it passed, and if there's anything that we can do to help push it through the Senate, just give us the word, and we'll do our best.

Thank you.

[The prepared statement of Dr. Rutford follows:]

TESTIMONY OF ROBERT H. RUTFORD  
EXCELLENCE IN EDUCATION FOUNDATION CHAIR  
PROFESSOR OF GEOSCIENCES  
THE UNIVERSITY OF TEXAS AT DALLAS  
BEFORE THE COMMITTEE ON SCIENCE  
UNITED STATES HOUSE OF REPRESENTATIVES  
APRIL 18, 1996

Mr. Chairman,

I am Robert H. Rutford, a professor from The University of Texas at Dallas where I hold the Excellence in Education Foundation Chair in Geosciences. I am a geologist who first went to Antarctica as a graduate student in 1959, completed a PhD dissertation dealing with the Ellsworth Mountains in Antarctica, and who made my fourteenth trip to Antarctica in January of 1995 to conduct research in the Royal Society Mountain Range across McMurdo Sound from McMurdo Station.

It is an honor for me to be here today to talk with you about Antarctica, science on that continent, and the leadership role that the United States has played in the Antarctic since the International Geophysical Year of 1955-56.

The passage of H.R. 3060 will enable the U.S. to become a party to the Protocol. The Environmental Protocol reinforces the role of the Antarctic as a place for science of global significance and for peaceful purposes. It further reflects the linkage between the protection of the Antarctic environment and the future conduct of science.

This has long been recognized by the Antarctic science community. The group of science advisors who came together to plan the International Geophysical Year (IGY) ultimately became SCAR. It was this group that not only launched the present science programs in Antarctica, but they also were the precursor to the Antarctic Treaty. SCAR became a permanent body after the IGY and has provided a continuing link between the science community and the Antarctic Treaty mechanism.

SCAR is a non-governmental body that links the science programs of all nations active in Antarctic research. SCAR does not conduct research but rather continually reviews the status of research and suggests areas where there is a need for additional study. It is the international scientific organization that represents the scientists in Antarctic matters.

In the U.S. the Polar Research Board of the National Academy of Sciences is National Committee for SCAR. I am the Delegate from the U.S. to SCAR. In the past I have served in many roles on the PRB, and I am the immediate past Chairman. The function of the PRB is to provide counsel and advice to agencies and others concerning Antarctic and Arctic science.

There is a long history of actions by SCAR and within the Antarctic Treaty Consultative Meetings (ATCM) that reflect a continuing concern by the scientific community for the environment. These actions date back to at least 1960 when SCAR developed "General Rules of Conduct for the Preservation and Conservation of Living Resources in Antarctica." At the first ATCM in 1961 the representatives urged their governments to recognize the need for measures to conserve living resources, and Recommendation 1-8 from that meeting promulgated general rules of conduct along the lines of those proposed by SCAR.

In 1964, again following a proposal from SCAR, the ATCM adopted "Agreed Measures for the Conservation of Antarctic Fauna and Flora." These Agreed Measures refer to the Antarctic as a Special Conservation Area, they require permits for any activities relating to native animals and birds, they designate Specially Protected Areas (SPAs) and prohibit entry into them except in accordance with a permit issued for scientific reasons.

Sites of Special Scientific Interest were designated by Recommendation VII-3 in 1972 and The Convention for the Conservation of Antarctic Seals was concluded in the same year. This brought SCAR directly into the Treaty arena as the contracting parties to the Convention report relevant activities not only to other parties but also to SCAR, and SCAR is asked to recommend quotas, etc. to the Convention parties. In 1980 the Convention for the Conservation of Antarctic Marine Living Resources (CCAMLR) was completed, and in 1991 the Protocol on Environmental Protection

(Environmental Protocol) to the Antarctic Treaty was recommended to governments for ratification.

All of these agreements were promulgated either as a result of a SCAR recommendation or they were accompanied by corresponding advice from SCAR. The ecosystem approach embodied in CCAMLR had its beginning in a conference sponsored by SCAR in 1976. A 1984 report by SCAR gave a scientific basis for the environmental impact assessment and monitoring provisions in the Environmental Protocol. Just completed in College Station, Texas, was the second of two meetings jointly sponsored by SCAR and the Council of Managers of National Antarctic Programs (COMNAP) dealing with the question how best to carry out the monitoring called for in the Environmental Protocol.

The Environmental Protocol provides a blueprint for the conduct of science and science support in the Antarctic. Of particular interest to the scientific community are the Annexes to the Protocol. It is here that the details of the procedures that might impact upon the conduct of science are found, and it is in the Annexes where there was considerable input from a broad segment of the Antarctic science community. I was privileged to participate in the Special Consultative meeting in Vina del Mar, Chile, where the major drafting effort for the Protocol was completed, and I can assure you that the voice of the scientists was heard.

The need for the U.S. to implement the Protocol is compelling. The U.S. has always been a leader in the implementation of Treaty recommendations, and in those instances where there was some delay in ratification, the U.S. has set in motion the rules and regulations that would place it in compliance even before the particular recommendation had been ratified. The U.S. must continue its leadership role in science and in the conservation and protection of the Antarctic environment. I cannot emphasize enough how important that role has been to the development of all of the environmental Conventions and agreements in the Antarctic and to the conduct of high quality research in Antarctica.

The question has been raised regarding the impact of the Protocol on U.S. researchers in the field. I can comment directly on that point from personal experience. Let me introduce my comments with a few facts about recent actions in Antarctica to implement the provisions of the Protocol.

The NSF has made a concerted effort to reduce the number of people going to Antarctica. A careful look at work schedules led to the decision to make changes in the scheduling of certain activities, shifting them from the busy summer months to the winter months. The result of this effort has been a decrease of about 200 persons during the summer maximum, but with an increase by about 65% in the number of scientists and support technicians doing research.

Energy conservation efforts have reduced fuel costs by over \$1.8 million, or in other terms, by 1.5 million gallons. The reduction in consumption has been accompanied by a corresponding reduction in the emission of atmospheric pollutants.

The concept of "take out what you bring in" has led to the retrograde of over 5 million pounds of waste each year. Seventy percent of the waste is recycled—compare this with the U.S. domestic average of 22%! Whatever the increased costs, they have been offset by efficiencies in other areas.

There are a dozen trained Antarctic Environmental Officers available within the NSF system. They have various areas of responsibility within the U.S. Antarctic Program and in addition they are responsible for the enforcement of the Antarctic Conservation Act that this bill will amend.

Now to how all of this impacts on the scientists. We are all briefed on environmental issues within the first 24 hours of arrival at McMurdo. For those of us who are old-timers, we can attest to the major clean-up that has taken place at McMurdo over the years. This effort started slowly during the 1970's and 1980's but the special funds that Congress provided to NSF made what looked like an impossible task, possible, and what you see at McMurdo and other U.S. stations today is something that we can all take pride in.

In anticipation of the implementation of the Environmental Protocol the U.S. Antarctic program has implemented many of the provisions of the annexes to that document. The scientists who go in the field now return ALL waste, including human waste, from land and ablation areas. Does this cause problems? Certainly, for a few hours, until people get into the swing of it. Then it soon becomes an effort to see how much can actually be returned. Old camp sites that are visited are cleaned up, flares that are used to mark landing sites are carefully recovered, and other items that may have been left in the past are marked for future pick-up. I think that I can honestly say that any extra time required to accomplish the waste management effort in the field is minimal and insignificant. The scientific community has bought into the Environmental Protocol in a meaningful way.

The policy implications of the Environmental Protocol have been examined in some detail by an ad hoc committee appointed by the Polar Research Board at the request of the Department of State. This Committee on Antarctic Policy and Science (CAPS) was charged to evaluate the possible impacts of policy decisions on scientific programs in Antarctica. Consideration of the possible implementing legislation for the Environmental Protocol was part of the committee's charge.

The report of the committee, "Science and Stewardship in Antarctica," was issued in late 1993. In Chapter 4, entitled "Implementation of the Environmental Protocol," one of the sections is called "Environmentally Responsible and Science-Friendly Legislation." Further sub-sections are headed by words such as Clarity, Flexibility, Simplicity, and Practicability. These refer not only to the design of the implementing legislation, but just as or even more important, to the drafting of the implementing regulations.

Copies of this bill have been distributed to a number of working Antarctic scientists with a call for comments. To date I have received only positive responses to H.R. 3060, and all are impressed by the clarity, simplicity, practicability, and friendliness toward science and the environment.

In November of 1995, in response to a Congressional mandate for a review of U.S. Antarctic Policy by the National Science Technology Council, the present and the past three Chairmen of the National Research Council's Polar Research Board wrote a letter to the President's Science Advisor in support of a national commitment to a vigorous and high quality Antarctic research program. That letter cited the important contribution of Antarctic research to the study of the ozone hole, the further understanding of the role of the southern oceans in exchanges between the ocean and the atmosphere, the long term climatic records from ice cores on the continent, and the major contributions to astronomy from South Pole Station. The crux of that letter was to urge the U.S. government to maintain its leadership role in Antarctic Science, noting that Antarctic research has been very productive.

There is no question about the leadership role of the U.S. Antarctic Program in Antarctic science in its actions to implement the provisions of the Environmental Protocol. Passage of H.R. 3060 will allow the U.S. to become a Party to the Protocol. Implementation of the Environmental Protocol will ensure the preservation of the Antarctic environment and the ability to conduct cutting edge science well into the future.

I am here today to urge you and your colleagues to pass H.R. 3060, an action that will officially return the U.S. to a dual leadership role in environmental matters and in science.

The CHAIRMAN. Thank you very much.

I think I'm going to preserve that testimony and frame it so that I can show people that at least at some point, someone stated that Congress did something with clarity and simplicity.

[Laughter.]

Mrs. MORELLA. In a bipartisan manner.

The CHAIRMAN. In a bipartisan manner, that's right.

But I thank you both very much for your testimony.

Ms. Fuller, you indicated a sense of urgency in your remarks about the need for passage.

What consequences do you foresee if 3060 should not be enacted this year?

Ms. FULLER. Well, Mr. Chairman, earlier there was a discussion about the standards that other countries are following. And they are, certainly I would say that the other parties are making efforts to conform to the various agreements, but the danger is, I think, that because there's variability among the standards, and the performance is not at the level of United States performance in the region, that you will have some diminution unless you can really get the Protocol moved through.

It is also true that this is a time when, in the run up to this next meeting, if the United States can exercise leadership, there is a pretty good likelihood that the other countries will come along.

If we lose the momentum, it may be years and years before one could actually see all 26 of these parties having ratified the treaty. The impetus, as you know, in international affairs can be pretty rapidly dissipated.

The CHAIRMAN. In your testimony, you indicate that there's an extremely broad array of environmental organizations that support the passage of the bill.

Do you know of any environmental group that does not support the passage of the legislation?

Ms. FULLER. This may be a remarkable statement in itself but, Mr. Chairman, I do not know of an environmental organization that is not in support of this legislation. All the environmental community has joined in support of H.R. 3060.

The CHAIRMAN. And have you heard any of them who have suggested changes that should be made to 3060 at this point?

Ms. FULLER. Not at this point.

The CHAIRMAN. Dr. Rutford, from a research perspective, why is it important to preserve the pristine nature of the Antarctic environment?

Dr. RUTFORD. Well I have a problem with the word "pristine," because any time we go there, we've mucked it up a little bit.

The CHAIRMAN. Okay, well that's true.

Dr. RUTFORD. The Antarctic has been and continues to be such a unique environment, it has global significance in terms of its impact on weather, on climate, on oceans. You know, we detect Antarctic bottom water well worth into the Atlantic Basin, and all one has to think about is getting ourselves into a situation where the Antarctic bottom waters are carrying something that far north into the northern hemisphere.

Some of the research that goes on in Antarctica depends upon the fact that it is a relatively probably one of the cleanest places on the earth where you can conduct research.

And the Protocol provides a safety net. It says, okay, this is what you're going to have to do. Instead of Rutford, you going to the Ellsworth Mountains and pounding on rock, you're going to have to stop now and tell people what it is you intend to do, what impacts your research in the Ellsworth Mountains are going to have. And then somebody other than me, I mean I may say it's a non-invasive kind of thing, but somebody else besides me is going to look at it.

And so I just think it's a good bill. I think the Protocols were well written and will help preserve that great laboratory for us.

The CHAIRMAN. I just remembered that I forgot to ask unanimous consent for your full testimony to be placed in the record, as well, which I will do at this point. And thank both of you for summarizing your testimony so that we can do it that way.

One other final question I'll ask of the others.

Do you know of anyone in the scientific community who is suggesting changes to the bill at this point?

Dr. RUTFORD. Absolutely not. As I said, it's a neat bill, it gets the job done, and you have the full support of everybody that I've talked with.

The CHAIRMAN. I thank you.

Mrs. Morella, questions of this panel?

Mrs. MORELLA. I don't have any questions, I just have thanks. I want to thank Ms. Fuller for the work she's done in bringing this to the attention of the environmental community and working with us on it.

And I want to thank Mr. Rutford for his very splendid testimony and the various features of Antarctica that you brought out that had not been brought out in other testimony. I appreciate that very much.

And again, Mr. Chairman, I say to you that I do not remember any bill that's come before us, whether there wasn't any need to like put a semicolon in or add a little phrase or a but or if to it.

And so I think this is a bill whose time has come.

And thank you.

The CHAIRMAN. Thank you very much.

Mr. Bartlett?

Mr. BARTLETT. Thank you very much.

I would like to commend the Chairman. I don't think I've ever sat on a hearing where everybody from both sides says, let's pass the bill, it's great and it doesn't need change.

The Chairman and the Staff have done a great job of putting this bill together.

The CHAIRMAN. We'll probably have a view that won't get that kind of recommendation.

[Laughter.]

Mr. BARTLETT. But we're starting out well.

As our globe becomes more crowded and people to seek to get away, they're going to about every place they can and one of those is Antarctica. And I understand that tourism is increasing there.

Does this pose a threat to the environment, and if so, how?

Ms. Fuller?

Ms. FULLER. Well, Mr. Bartlett, the tourism is still modest in absolute terms. It was 8,000 a year or so ago. It may be as high as 9,000 now. But the environment is so fragile that when you have people, whether it is scientists or whether it's tourists with a presence in Antarctica, you have impacts that can be substantial.

What the legislation would do is to ensure that there is an environmental assessment of any tourism and that permits are required for any sensitive activities.

It will also help to ensure that those tour operators that have not already subscribed to pretty stringent standards for environmentally sensitive tourism in the region do so.

It'll help once again to elevate awareness.

It is, though I said before, tourism, whether it's in Antarctica or other parts of the world in ecologically sensitive areas, is both a boon and a bane. It creates a really powerful constituency for conservation. Knowledgeable people who care profoundly about what it is that they've experienced, but their presence inevitably has an impact, so it's important to have standards so that tourism doesn't overwhelm the resource.

Mr. BARTLETT. Are we concerned about what they would leave there where you have numbing cold and fierce winds. That's a pretty harsh environment. We're concerned about things that they would leave there that would be chemical pollutants?

We're certainly not concerned about their being there and leaving without leaving things there, are we?

Ms. FULLER. Well, we want to make sure that any tourists who are there are following the same standards that the scientific community is. And really the quite remarkable record that has been achieved through the National Science Foundation program and others of recycling, the experience Mrs. Morella described is a pretty amazing one, and it would be terrific if we could replicate that even more broadly in other parts of the world.

Dr. RUTFORD. Let me just comment. Back in 1990 or '91, because I was an outspoken critic of tourism in Antarctic, I actually went on a tour ship as a guide, a science person. And I came back after 21 days in sub-Antarctic and the Antarctic Peninsula with a very changed attitude towards tourism in the Antarctic.

On the particular ship that I was on, there was a great deal of attention paid to environmental matters. As a matter of fact, one of my fellow guides on the cruise ship would be certainly a representative of the environmental community at that time.

And so the sensitivity of at least that tour ship was very keen and you know, there were sweepers that came along behind and picked up any rolls of film or anything that people left behind.

But it's a cumulative impact, number one, that I think we all worry about, and that is that there's a tendency to always visit the same spot by the cruise ships.

And so maybe A just does a little bit, but by the time you go A through Z, then you may have a cumulative impact that is irreversible.

Secondly, from the scientists' standpoint, I think we all live kind of holding our breath, waiting for something to happen that will take the logistic support away from science to rescue Joe Smith who fell down a crevasse or somebody who did something, a tourist group or whatever who did something dumb.

And that impacts on science and we worry about that because the helicopter that was supposed to take us into the field today is now diverted to go pick somebody off the mountain who shouldn't have been there in the first place. So that's, I think from the scientific standpoint, that concerns us greatly.

Mr. BARTLETT. Thank you.

Thank you, Mr. Chairman.

The CHAIRMAN. Mr. Roemer?

Mr. ROEMER. Thank you, Mr. Chairman.

I too would like to join in the praise to you and to Mr. Brown for working together in a truly bipartisan way and coming up with an extraordinary bill that has unified all the environmental community and we have not heard a bad word about this bill from anybody testifying.

So this is truly the kind of bipartisanship that I think the American people want to see to address some of the very difficult problems we have in this country and in dealing with scientific problems in other parts of the world.

Let me ask just a couple of very basic questions.

One, Ms. Fuller, there was testimony in a previous hearing about maybe an inadvertent effect of banning disposable batteries and that impact on weather balloons.



Is there going to be any kind of impact here? Do we have to amend this treaty? Have you worked around that problem? Is it not a problem?

Ms. FULLER. I'm not familiar with the particular testimony in the past, but what this legislation does is to put in place the high standards that are established in the Protocol and its annexes, and so from our perspective, both the environmental impact processes and the standards that are set for waste disposal, for species protection and so forth are very high and adequate.

Dr. RUTFORD. I would just comment that the batteries on the balloons are not a problem with regard to the Protocol.

Mr. ROEMER. Has it changed the way you dispose of those batteries at all?

Dr. RUTFORD. Well, I think that on the ice, if I'm not mistaken, you chase them down.

Mr. ROEMER. Can you find them all?

Dr. RUTFORD. Well, I think they are finding a very high percentage of them and picking them up with helicopters if they are close enough to the station, to McMurdo or with C130 if they're a ways away. But I know when I was there last January, they picked up at least two, one long, long helicopter flight out to pick it up.

What it has done is increase the sensitivity and it's been done in a very deliberate and a very successful way.

Mr. ROEMER. Ms. Fuller, in your testimony, you say that indeed this Protocol could encourage more cooperative science programs and reduce the need for multiple facilities.

Could you explain a little bit more about how that cooperative science could benefit us as well?

Ms. FULLER. Well earlier, there was a question about how many countries are directly engaged in the science and some reference to the expense associated with scientific research in the region.

Any strong international agreement of this sort I think, in and of itself, fosters the kinds of linkages that produce joint efforts to do research.

And so if you have all 26 nations having agreed and ratified this legislation, part of a process of meetings and implementation, then that does foster joint efforts in research and management.

Mr. ROEMER. Dr. Rutford, my final question would be, from the briefings I've received on this, the implementation of this Protocol will not cost the NSF or the U.S. taxpayer any additional money whatsoever.

First of all, is that true?

And secondly, is that true for other countries to implement this, such as Russia?

Dr. RUTFORD. I think that because the National Science Foundation, in anticipation of the eventual implementation of the Protocol, has already begun the process that a lot of the adjustments that are necessary have taken place.

And so from my point of view, the impact on science or the cost to science is pretty much transparent.

Now what happens at McMurdo in terms of sorting and that sort of thing, certainly there's an increased cost, but that's been offset by other efficiencies. So that you know the bottom line is the same.

And I think the important thing is that you know, if you carry it in, you carry it out. And this recycling effort certainly is, you know, they are recovering some costs on the end back where the material gets recycled, so I think that's a big plus.

Mr. ROEMER. And do you know about Russia, whether they have—

Dr. RUTFORD. Well, they've got a very, very difficult problem. I have visited the Arctic and Antarctic Institute in St. Petersburg several times in the last two or three years and it is not the booming scientific center that it was before the dismantling of the Soviet Union.

I think that there, for example, on King George Island, there has been an effort not only by the Russians but by the international community to assist them in cleaning up some of their base there. And I think that will continue in other places.

I think there's a general—I guess what surprises me is, and you know, being kind of cynical about some of these things, is that this, the people have bought into this thing. They see that it works, and if you could have visited McMurdo station 20 years ago and see it today, you wouldn't believe it was the same place because of the clean up that has been accomplished in that time period.

And you folks made it possible.

I mean, during the 70s and 80s, it was, you know, picked away at a little bit but about four or five years ago, Congress gave the National Science Foundation a big chunk of money to clean it up. And I have to tell you that you should all pat yourselves on the back, and you should pat the people at NSF on the back for doing a fantastic job. I'm proud of the place.

Mr. ROEMER. Well that's a nice way to end your testimony, Dr. Rutford, because my time has run out and it's a nice segway to again saying congratulations to the Chairman and the Ranking Member for this bipartisan effort.

The CHAIRMAN. Thank you very much.

Mr. Gutknecht?

Mr. GUTKNECHT. Mr. Chairman, all the questions that I had have already been asked and answered, so thank you.

The CHAIRMAN. Mr. Davis?

Mr. DAVIS. What's the old saying? Everything's been said but not everybody's said it. I'm just happy to be a cosponsor of this.

Let me just ask one question.

Of the other countries participating, absent this treaty, who is really in a violation mode down there? Is anybody not playing ball?

Dr. RUTFORD. Not that I know of. I mean certainly not every nation, including the U.S., has met all of the standards, but I think there's a good faith effort.

Mr. DAVIS. Genuine consensus of what needs to be done and a good faith effort?

Dr. RUTFORD. I think everybody knows what has to be done and the rate at which it will be accomplished is going to be different for each one of the countries. But I'm confident that everybody has good faith.

Mr. DAVIS. Ms. Fuller, do you agree with that?

Ms. FULLER. Yes, I do.

Mr. DAVIS. Thank you.

The CHAIRMAN. Thank you, Mr. Davis.

Ms. McCarthy?

Ms. MCCARTHY. Thank you, Mr. Chairman.

I just want to join the others with my comments of praise to you and the Ranking Member for this hearing and this action, and it's a good bipartisan effort.

And I wanted to commend the panel too for all the work that they've been doing over the years, cooperatively with Congress and with other nations, to see this effort through. I wish you well in that endeavor and you have my complete support.

Thank you, Mr. Chairman.

The CHAIRMAN. Thank you very much.

And Mr. Weldon, did I understand you have no questions?

Mr. DAVE WELDON. No.

The CHAIRMAN. No questions Mr. Weldon.

With that, I believe we have covered everybody and everything. We thank you very, very much for your testimony. And I thank the members for their participation. And with that, the Committee stands adjourned.

[Whereupon, at 11:05 a.m., Thursday, April 18, 1996, the hearing was adjourned.]

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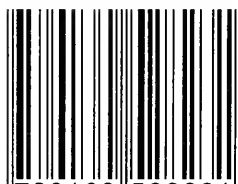


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